

# Large Subcapsular Liver Hematoma Following Single-Incision Laparoscopic Cholecystectomy

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## ABSTRACT

**Background and Objectives:** Many laparoscopic surgeons are now transitioning from standard multiple-port laparoscopic cholecystectomy to single-incision laparoscopic surgery (SILS) in an attempt to improve cosmetic outcomes and decrease postoperative morbidity. However, little has been published regarding the potential complications of SILS operations.

**Methods:** We report the case of a patient undergoing SILS cholecystectomy who developed the complication of a large hepatic hematoma, resulting in significant postoperative morbidity, blood transfusion requirement, and reoperation.

**Results:** After an in-depth internal review of the postoperative morbidity of this case, it appears that the causative factor may be instrument shaft torque on the liver surface.

**Conclusion:** Single-incision laparoscopic surgery may pose significant and unique risks that warrant additional operative caution. Quantitative comparison of SILS to the gold-standard laparoscopic cholecystectomy is needed to further elucidate definitive benefits and complications of this novel technique.

**Key Words:** Single-incision laparoscopic surgery, Cholecystectomy, Complication, Liver hematoma.

## INTRODUCTION

Much excitement has been generated over the novel technique of single-incision laparoscopic surgery (SILS) as a minimally invasive means of surgical access. The impetus for the emerging technique appears to be patient desire for improved cosmesis. Additionally, there has been some indication that patients experience less incisional morbidity and quicker recovery with SILS compared with standard laparoscopic procedures.<sup>1-9</sup> However, little has been published regarding the potential complications of these operations. We describe the case of a young woman with biliary dyskinesia who had significant postoperative morbidity due to a large subcapsular liver hematoma, resultant anemia, and a large, sympathetic pleural effusion resulting from a SILS cholecystectomy.

## METHODS

The patient is an otherwise healthy, thin, 25-year-old female with no past surgical history, who presented with longstanding right upper quadrant pain that worsened with fatty food intake. The physical examination was normal, with no right upper quadrant abdominal tenderness. Pancreatic enzymes and liver function tests were normal. An abdominal ultrasound demonstrated no cholelithiasis, gallbladder wall thickening, or choledocholithiasis, and the common bile duct measured 2mm. A CT scan of the abdomen and pelvis was normal. However, a HIDA scan showed an ejection fraction of 28%, consistent with biliary dyskinesia. The patient opted for a single-incision laparoscopic cholecystectomy and was advised of the potential need for conversion to formal laparoscopic or open cholecystectomy.

## Operative Details

A 2.5-cm skin incision was made in the umbilicus. Through this incision, pneumoperitoneum was established by inserting a Veress needle. All 3 trocars were placed in a craniocaudal line through the single incision: an 11-mm Optiview trocar placed inferiorly, followed by 2 low profile 5-mm trocars superiorly.

All maneuvers were completed under direct visualization. A 2-0 nylon suture on a straight needle was placed per-

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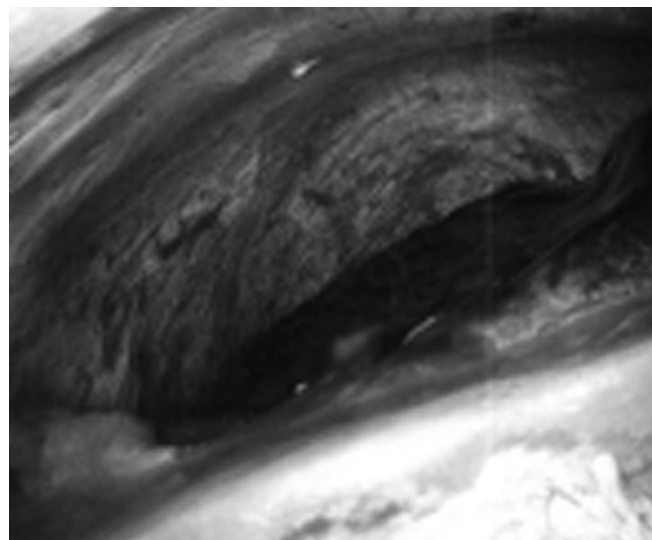
cutaneously through the abdominal wall in the lateral subcostal space. The needle was then grasped with a Maryland grasper under direct vision and laparoscopically passed through the fundus of the gallbladder, and back through the abdominal wall. Gentle external traction on the suture provided lateral retraction of the fundus of the gallbladder, exposing the critical view of the cholecystohepatic window for safe dissection. By using a fine-tipped Maryland grasper, the cystic duct and artery were dissected. The cystic duct and artery were divided after proximal and distal 5-mm Endoclips were placed in the standard laparoscopic fashion. The gallbladder was dissected from the gallbladder fossa by using a hooked cautery probe.

There was no evidence of bleeding at the conclusion of the procedure. The right upper abdominal quadrant was irrigated and aspirated by directing a standard laparoscopic suction-irrigator over the dome of the liver. The gallbladder was removed in an endoscopic pouch through the 11-mm trocar and the fascial and skin incisions sutured closed.

## RESULTS

On postoperative day one, the patient began experiencing significant right upper quadrant pain. Laboratory evaluation revealed a 15% drop in hematocrit from preoperative levels. The patient was observed for another 24 hours. On postoperative day 2, her pain persisted and her hematocrit dropped another 15%. We decided to urgently reexplore her to control her suspected bleeding. The previous single-incision surgical site was reopened, and the abdomen was insufflated after an 11-mm trocar was placed. There was no free hemoperitoneum. However, a large subcapsular hematoma (**Figure 1**) was identified on the dome of the right side of the liver that extended onto the left medial segment.

In the process of irrigating over the liver, a small tear was made in the friable capsule over the hematoma. The clot was then evacuated with suction. Minimal areas of hepatic parenchymal oozing were controlled with cautery. Oxidized cellulose and hemostatic matrix were applied over the decapsulated area of the liver, achieving hemostasis. The patient received 4 units of red blood cells and 2 units of fresh frozen plasma. The patient was transferred to an ICU bed, monitored closely, and kept on strict bedrest for 72 hours. Her hematocrit remained stable. However, she developed dyspnea and a large, sympathetic right pleural effusion that was treated with a pigtail pleural catheter. The patient improved and was discharged home in good



**Figure 1.** Large subcapsular liver hematoma.

condition on postoperative day 7 after her initial procedure.

## DISCUSSION

Single-port access surgery has been described as the next generation of minimally invasive surgery. Anecdotally, current literature suggests that patients are satisfied with their postoperative cosmetic outcomes. However, quantifiable data to compare scar satisfaction and postoperative pain is needed to accurately assess the role of SILS cholecystectomy.

Ergonomic limitations may limit the surgical advantage of single-port laparoscopy. It is clear that the angle of approach to the gallbladder required in SILS cholecystectomy differs significantly from that in standard laparoscopic cholecystectomy. Specifically, using a suction-irrigator to aspirate fluid from above and lateral to the liver may require excessive torque to be applied on the liver by the instrument shaft. To our knowledge, no published data evaluate the safety of using these altered angles of approach to the gallbladder. After in-depth internal review of the postoperative morbidity of this case, it appears that the causative factor may have been the torque of the instrument shaft on the liver surface, inducing a shear injury. We believe that surgeons practicing SILS techniques should be aware of this potential injury and should exercise caution to avoid it. Additional research should be directed towards the safety, utility, risks, and reproducibility of SILS procedures.

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